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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,423	02/14/2006	Noboru Oshima	285118US0PCT	9219

22850 7590 09/27/2006

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EXAMINER

TESKIN, FRED M

ART UNIT PAPER NUMBER

1713

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

6

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/568,423	OSHIMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Fred M. Teskin	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-20 is/are rejected.
- 7) ☒ Claim(s) 6, 8, 9 and 16-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>021406; 052606; 082406</u> .                                  | 6) <input type="checkbox"/> Other: ____.                          |

Art Unit: 1713

The preliminary amendment of 14 February 2006 has been entered. Claims 1-20 are currently pending and under examination.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claims 6 and 16-19 are objected to because of the following informalities: the term "bicycle" should read –bicyclo- in each occurrence of "bicycle[2.2.1]hept-2-ene" in said claims (*cf.*, Specification page 15, line 18). Appropriate correction is required.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 is rendered inconsistent with its parent claim by the recitation of "a *hydrocarbon* group of 1 to 15 carbon atoms"; see the definition of A<sup>1</sup> to A<sup>4</sup> in lines 3-4. According to claim 1, the same variables are defined as an *alkyl* group of 1 to 15 carbon atoms. Appropriate correction is required.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

Art Unit: 1713

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined disclosures of Mathew et al (*Macromolecules* **1996**, 29, 2755-2763) and US 5629398 to Okamoto et al.

Mathew et al report Pd(II) catalyzed homo- and co-polymerizations of norbornene derivatives functionalized with ester, hydroxyl and carboxylic acid groups. The reactions were carried out in the presence of  $[\text{Pd}(\text{CH}_3\text{CN})_4][\text{BF}_4]_2$  as catalyst. See page 2755, final paragraph; page 2756, Table 1 and pages 2758-2759. The polymer obtained is a cycloolefin addition polymer as shown in reaction schemes (1), (3) and (4).

The principal difference between Mathew et al and the claimed invention is that this reference does not utilize a multi-component catalyst comprising a phosphorus

Art Unit: 1713

compound corresponding to applicants' component (b) as claimed; e.g., a phosphonium salt represented by claim formula (b-1).

It is, however, known from Okamoto et al that a multi-component catalyst based on (A) a transition metal compound; (B) a compound capable of forming an ionic complex when reacted with a transition metal compound; and (C) an organoaluminum compound shows excellent polymerization activities for the homopolymerization of cyclic olefin or the copolymerization of cyclic olefin and alpha-olefin without ring-opening during the polymerization (see col. 2, lines 55+ and col. 3, lines 5-7). Suitable cyclic olefins include norbornenes substituted with functional groups such as carboxyl or alkoxycarbonyl (i.e., ester; see col. 13, lines 64-67 and col. 14, lines 21-26 and 56-57) and the transition metal compound may be selected from palladium compounds, including specific  $\beta$ -diketone compounds of Pd and tetrakis(acetonitrile)palladium bis-tetrafluoroborate, the same catalyst used in Mathew et al. Okamoto, col. 5, lines 15-16 and col. 8, lines 15-25. Further, in enumerating preferred species of compound (B), Okamoto et al name tetraphenylphosphonium tetrakis(perfluorophenyl)borate, a phosphonium salt corresponding to formula (b-1) in claim 1 (see col. 9, lines 39-41 and col. 10, line 26). Thus, Okamoto et al would have taught those of ordinary skill to combine the requisite phosphonium salt and organoaluminum compound with a palladium compound to obtain a multi-component catalyst effective in addition polymerizing cycloolefin compounds at high polymerization activity.

At the time of applicants' invention it would have been obvious to one of ordinary skill in the art to modify Mathew et al by undertaking the described

Art Unit: 1713

polymerization in the presence of a phosphonium salt such as tetraphenylphosphonium tetrakis(perfluorophenyl)borate and an organoaluminum compound as per Okamoto et al, motivated by a reasonable expectation of success in elevating polymerization activity consistent with the teachings of Okamoto et al.

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Vogel is pertinent to tris(pentafluorophenyl)borane-coordinated derivatives of, *inter alia*, phosphonium-carboxylates, acetylacetonates, cyclohexa-1,3-diones or nitrates as catalyst activators for an addition polymerization catalyst (note col. 4, ll. 8-9 and col. 6, line 66 to col. 7, line 4).


Claims 8 and 9 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Art Unit: 1713

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
FRED TESKIN  
PRIMARY EXAMINER  
1713

FMTeskin/09-25-06